

REMARKS

Claims 1-4 and 6-8 are pending in this application. By this Amendment, claims 1-4 are amended. Claims 5 and 9-12 are canceled without prejudice to, or disclaimer of, the subject matter therein.

In the amendment to claim 1, the formula at the end of the claim is amended to incorporate the formula originally recited in dependent claim 2. The amendment to claim 1 also clarifies that, in the RF module recited therein, the propagation region of electromagnetic wave is the region surrounded by the ground electrodes facing each other in the plurality of through holes.

At the top of page 2, the Office Action objects to claims 1-3 and 9 for the specified informality. Claim 9 is canceled without prejudice to, or disclaimer of, the subject matter therein. Claims 1-3 are amended so that each claim is drafted as a single sentence. For at least the foregoing reasons, it is respectfully requested that the objection to claims 1-3 and 9 be withdrawn.

On pages 2-3, the Office Action rejects claims 1, 3, 5-7 and 9 under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,788,918 to Saitoh et al. (hereinafter "Saitoh"). On page 3, the Office Action rejects claims 1, 3, 5-7 and 9 under 35 U.S.C. §102(b) as being anticipated by Uchimura et al. (Development of a "Laminated Waveguide") (hereinafter "Uchimura"). On pages 3-4, the Office Action rejects claims 1, 3 and 5-9 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 6,380,825 to Takenoshita et al. (hereinafter "Takenoshita"). On page 5, the Office Action rejects claims 2, 4, 5 and 7 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,356,172 to Koivisto et al. (hereinafter "Koivisto"). On pages 5-6, the Office Action rejects claim 4 under 35 U.S.C. §103(a) as being unpatentable over Saitoh, Uchimura or Takenoshita in view of U.S. Patent No. 5,208,561 to Delestre et al. (hereinafter "Delestre"). On pages 6-7, the Office Action

rejects claims 10-12 under 35 U.S.C. §102(b) as being anticipated by, or, in the alternative, under 35 U.S.C. §103(a) as obvious over Takenoshita. These rejections are respectfully traversed.

Claims 5 and 9-12 are canceled without prejudice to, or disclaimer of, the subject matter therein.

The subject matter recited in claims 1-4 and 6-8 optimizes arrangement of the through holes according to the relation between the interval d between centers of neighboring through holes and the radius r when the propagation region of electromagnetic waves is formed with the ground electrodes facing each other and the plurality of through holes. By such an optimization, the subject matter recited in claims 1-4 and 6-8 can propagate electromagnetic waves effectively irrespective of a signal wavelength and the like.

In the subject matter recited in claims 1-4 and 6-8, the relation between the radius r of the through holes and an interval d between centers of neighboring through holes is defined as $3.6r < d < 4.0r \dots (A - 1)$. Saitoh discloses $r = 0.05$ mm, $d = 0.4$ mm, and $d = 8r$. Uchimura discloses $r = 0.05$ mm, $d = 0.26$ or 0.52 mm, and $d = 5.2r$ or $10.4r$. Takenoshita discloses $r = 0.08$ mm, $d = 1.58$ mm, $r = 0.05$ mm, $d = 0.25$ mm, $d = 19.75r$, and $d = 5r$.

Therefore, by limiting the range recited in claims 1-4 and 6-8, the rejection based on the citations above is overcome. In the citations, the relation between r and d is not included within the range of the formula $(A - 1)$ recited in claims 1-4 and 6-8, and thus the citations do not disclose, teach or suggest the subject matter recited in claims 1-4 and 6-8.

Further, Koivisto discloses a cavity resonator (10) and connecting the cavity resonator (10) and an integrated circuit (15) via an excitation coupling (18). Moreover, Koivisto discloses forming vias (19) in predetermined intervals along the surrounding of the excitation coupling (18). In Koivisto, a signal is delivered to the cavity resonator (10) via the excitation coupling (18), and the structure of the transmission line is completely different

from the structure of the waveguide recited in claims 1-4 and 6-8, where the electromagnetic wave propagates through the region surrounded by the ground electrodes facing each other and the through holes bringing the ground electrodes into conduction. Further, Koivisto does not disclose, teach or suggest functioning the vias as a conductive wall to prevent leakage of the electromagnetic wave. The subject matter recited in claims 1-4 and 6-8 cannot be inherent from Koivisto because the structure recited in claims 1-4 and 6-8, the relation between the center interval d between through holes and the radius r of the through holes, is completely different from Koivisto.

Furthermore, Koivisto and the other cited references do not describe the fundamental concept of the subject matter recited in claims 1-4 and 6-8 that "optimization of the arrangement of through holes only by the relation between radius r and center interval d irrespective of a wavelength λ and the like."

For at least the foregoing reasons, it is respectfully requested that all of the prior art rejections of the claims be withdrawn.

On pages 7-8, the Office Action discusses the Information Disclosure Statement filed on December 12, 2003. In response to the issues raised by the Office Action, another Information Disclosure Statement is submitted herewith. It is respectfully requested that the references submitted with that Information Disclosure Statement be considered.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-4 and 6-8 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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Attachment:
Information Disclosure Statement

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